

Date _____

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1588 West North Temple
Salt Lake City, Utah 84116

MINING AND RECLAMATION PLAN

(Other forms may be used in lieu of MR 2, provided
they contain the same information)

1. Name of Applicant or Company Cotter Corporation
2. Proposed type of operation Underground uranium mine
3. (a) Prior Land Use(s) Mining
(b) Current Land Use(s) Mining
(c) Possible or Prospective Future Land Use(s) Rangeland
4. What vegetation exists on the land proposed to be affected _____
Rabbit Brush, Indian Rice Grass
(a) Types and Estimated Percent cover or density: _____
Estimated, 0 - 10% total vegetative cover
5. What is the pH range of soil before mining? 7.8 - 8.1 pH
Name of Person or Agency and method of determining pH Analysis by
Soil Testing Laboratory, Utah State University (see attached methodology)
6. Site elevation above sea level 4500 ft.
7. In case of coal, oil shale, and bituminous sandstone:
Principal seam(s) and thickness(es) N/A
8. Estimated duration of mining operations Fifteen (15) years
9. Has overburden, waste or rejected materials been classified as acid or alkali producing? () Yes (X) No
Does the above material being moved have any other characteristics affecting revegetation? Although the soil and rejected materials have not been characterized by lab analysis, the areas to be reclaimed are generally considered alk. producing.
10. Will any underground workings or aquifers be encountered? () Yes (X) No
Describe N/A
Is there an active discharge of water from abandoned deep mines on or crossing the land affected? () Yes (X) No If yes, describe the quality of water being discharged. N/A

11. Describe specifically a detailed procedure for: (See attached response)
- (a) The mining sequence
 - (b) The procedure for constructing and maintaining access roads, to include a typical cross-section and a profile of the proposed road grades.
 - (c) The procedure for site preparation including removing trees and brush.
 - (d) The method for removing and stockpiling topsoil or disturbed materials.
 - (e) The method for the placement or containment of all disturbed materials, to include the method for handling of all acid or alkali-producing and toxic materials.
 - (f) A procedure for final stabilization of disturbed materials.

GRADING AND REGRADING

Specifically describe: (See attached response)

- (a) Typical cross-section of regrading.
- (b) The method of spreading topsoil or upper horizon material on the regraded area and indicate the approximate thickness of the final surfacing material.
- (c) What type of soil treatment will be utilized.
- (d) The method of drainage control for the final regraded area.
- (e) Maximum grading slope.

TESTING

(See attached response)

1. Describe method for testing stability of reclamation fill material.

Describe method for the testing of soil that is intended to support vegetation

2. Describe any soil treatment employed as an aid to revegetation

3. Describe surface preparation of areas intended to support vegetation:

REVEGETATION

- * 1. Revegetation to be completed by:

<input checked="" type="checkbox"/> Operator	<input type="checkbox"/> Hydroseeding
<input type="checkbox"/> Soil Conservation District	<input type="checkbox"/> Aerial Seeding
<input type="checkbox"/> Private Contractor	<input type="checkbox"/> Conventional or Rangeland Drill
<input type="checkbox"/> Other (specify) _____	<input checked="" type="checkbox"/> Broadcast and Drag
	<input type="checkbox"/> Other _____

Item 11 continued -

11(a) The mining sequence is two-fold:

1. Cotter Corporation is presently operating in a reopened mine (see Figure 1). Operations in this mine began in 1976. Daily production from this mine is anticipated to be a minimum of one hundred (100) tons. It is also anticipated that this mine will continue to operate through the year 1980.
2. The second phase of mining operations will commence at the new mine (see Figure 1) in July, 1977. Anticipated minimum daily production from this mine is one hundred (100) tons. It is anticipated that this mine will continue to operate through the year 1992.

11(b) All necessary access roads were constructed during development of the site for the old (reopened) mine. Total length of access roads to the mine site is five hundred (500) feet. The cross-section and grade of the total road length is flat.

11(c) All site preparation and development was completed prior to commencing operation of the old (reopened) mine. Minimum additional site preparation will be required in order to begin operations at the new mine. Except for a new shop and a compressor shed, pre-existing buildings and mined waste storage areas will also be sufficient to accomodate the new mine.

11(d) Cotter will continue to stockpile mined waste at pre-existing storage areas (see Figure 1). It is anticipated that there will not be any requirements for additional waste storage areas. Since the new mine will be an underground operation, no significant quantities of topsoil will be removed, stockpiled, or disturbed.

11(e) Cotter will employ a front-end loader to spread mine waste materials over the pre-existing waste storage areas. The size of the waste storage areas are approximately 500 ft. x 175 ft. and 175 ft. x 50 ft. and are bounded on the south by the canyon walls.

11(f) In order to insure final stabilization of disturbed materials, Cotter Corporation will regrade the tops of each waste storage area so each adopts a rounded appearance. This will include rounding of waste berms to less than the angle of repose.

GRADING AND REGRADING

- (a) Cotter Corporation will regrade roads, equipment storage areas and abandoned building sites so that topographic contours will conform to the surrounding terrain of the Corral Canyon floor prior to permanent seeding. Waste storage areas will be regraded as described in 11(f) above.
- (b) Cotter Corporation will spread upper horizon material ^uof roads, equipment storage areas and abandoned building sites using material immediately adjacent to each of these locations. The upper horizon material which consists of sand, eroded sandstone and mudstone varies in thickness from zero to several inches over the canyon floor.
- (c) The method of soil treatment to be utilized after regrading will consist primarily of seedbed preparation to a depth of six to eight inches. This will assure rapid moisture infiltration and adequate moisture storage.
- (d) Except for waste storage areas, the method of drainage control to be employed for the final, regraded area will be based upon regrading the surface in a manner with surrounding terrain contours. The waste storage areas will be regraded so that the tops of the waste berms adopt a rounded appearance.
- (e) Except for waste storage areas, the maximum horizontal:vertical grading slope ratio will not exceed 2.5:1 or will generally be less than the existing slope of the southern edge of the canyon floor. As previously noted, the maximum grading slope for the waste storage areas will be less than the angle of repose.

TESTING

1. The stability of the waste storage areas is a function of the slope of the dump, the size of the waste material and erosion potential of the base of the dump. Cotter Corporation will evaluate the pre-existing waste storage areas to determine their stability and the conditions which have insured that stability. The optimum slope of the dump will be the variable that can be best controlled by Cotter and it will be employed to guarantee waste storage stability.

The stability of the roads, equipment storage areas and abandoned building sites reclaimed by Cotter will be determined by the compaction of the sub-surface material and by the rapidity of replanted seed germination and the establishment of an extensive root system.

(See attached soil test report for an explanation of the soil test methodology.)

TESTING (continued)

2. Cotter will treat the soil with nitrogen at a rate of 30 pounds per acre and with phosphorous at a rate of 60 pounds per acre.
3. The surface preparation employed as an aid to revegetation will consist primarily of seedbed preparation to a depth of six to eight inches. This will assure rapid moisture infiltration and adequate moisture storage.

SOIL TEST REPORT
and
FERTILIZER RECOMMENDATIONS

Name Cotter Corporation
Street _____
City, State Moab, Utah 84532
ZIP

Date received 5/13/77
Payment received \$ 8.00
Balance due \$ 0

Your USU Extension Agent James Stevens
Monticello, Ut.

LABORATORY REPORT

Lab. No.	Sample No.	Crop	Soil Texture (Estimated)	Lime	pH	Soluble Salts EC _e	Organic Matter %	Plant Nutrient Index		
								Nitrate ppm N	Phosphorus ppm P	Potassium ppm K
1777	1	dry farm	Sandy C Loam	++	7.8	8.8			1.2	>320
1778	2	"	Sandy Loam	++	8.1	.3			2.4	205

ATTENTION GROWERS

These fertilizer recommendations are based on the soil analysis results, the information you supplied on the Description sheet, and on the average growing season for your area. They are guides developed from the best available scientific data, but may require some modification for your specific situation. Consult your Extension Agent for more details.

Remember that a high yield goal can be attained only when proper fertilization is used in combination with crop production management and climatic conditions consistent with that yield goal.

USU POLICY

It is the policy of the USU Soil Testing Laboratory to recommend only those nutrients that offer a reasonable possibility of increasing the yield of your crops, and in those amounts that should be necessary to achieve your yield capability. Ranges of nutrients are sometimes given, to permit some farm operator judgement.

FERTILIZER RECOMMENDATIONS FOR 1977 CROP

Sample No.	Pounds of Nutrient per acre				* Special Notes
	Nitrogen (N)	Phosphorus (as P ₂ O ₅)	Potassium (as K ₂ O)	Other	
1	30-50	60	0		3, 5b
2	30-50	60	0		3, -

*See referenced notes on the back of this sheet for explanations and special instructions.

$$P_2O_5 \times .45 = P$$

$$K_2O \times .82 = K$$

SOIL SAMPLING PROCEDURE

Follow the steps below to get a sample that is truly representative of your field. Good samples mean more reliable results and recommendations.

WHEN TO SAMPLE: Samples for routine testing may be taken at any time of year. Early fall is often preferred. Allow enough time to get test results back before making decisions regarding how much fertilizer should be purchased or applied for each field. See separate special instructions for sampling for nitrogen tests.

TOOLS: Obtain a suitable sampling tool, and a clean plastic bucket for each depth to be sampled. Special augers and tubes are available at your USU Extension Office. A shovel will serve for topsoil samples if the steps below are followed.

AREA: Look over your field and sample only uniform areas. Each area should have the same soil color, texture, drainage, and the same past cropping and fertilizer treatment. Leave out low spots, eroded ridges, alkali spots, etc., or else sample them separately.

For each area to be sampled, take separate samples from approximately 10 locations in a pattern that will represent the entire area.

DEPTH: (a) Standard topsoil sample: Take uniform samples from surface to 12 inches depth.

(b) For subsoil testing: Starting at the bottom of the topsoil sample hole, take a subsoil sample to 24 inches and another to 36 inches deep. Keep subsoil samples separate from topsoil samples. Record actual depth. Keep depths separate.

SAMPLING: Scrape away grass or litter. Avoid manure spots.

(a) Using soil tube or auger: follow instructions given with the tool.

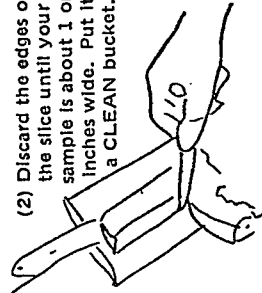
(b) Using shovel:

- (1) Dig a V-shaped hole to plow depth. Remove a 1-inch slice of soil from one side.



- (3) Repeat 1 and 2 for other samples for the sampling area.

- (2) Discard the edges of the slice until your sample is about 1 or 2 inches wide. Put it in a CLEAN bucket.



FIELD 2 Slope (grain)	FIELD 1 Ridge (alfalfa)			
	FIELD 3 Low (beets)			
FIELD 4 Low (grain)				

SAMPLE HANDLING: Combine the samples from the field in a clean container. Mix them well, then take about 2/3 pint to send for analysis.

Send samples prepaid by parcel post or express, accompanied by this Description Form and a check payable to the Soil Testing Laboratory, USU, Logan, Utah 84322.

2. Will Mulch be used? () Yes (X) No

Type: N/A Rate/Acre N/A lbs.

3. Revegetation Plan and Schedule -

Species	Rate/ Acre	Planting Location	Facing N-S-E-W	Season to be replanted
Blue grama grass	4 lbs/acre	Reclaimed roads,	Valley floor	Fall
Black " "	2 lbs/acre	abandoned building sites, and equipment		Fall
Indian Rice gr.	14 lbs/acre	storage areas		Fall

4. Will affected area be subject to livestock or wildlife grazing?

(X) Yes () No Will vegetation protection be needed? No. Due to the timetable for planting, limited reclaimed area and anticipated infrequent visits by livestock, no protection of vegetation will be required.

5. Will irrigation be used: () Yes (X) No Type N/A

6. Describe maintenance procedures for revegetation if needed, until surety release is granted. Maintenance procedures such as the application of a herbicide or mowing will not be necessary and therefore will not be employed at this mine.

STATE OF ColoradoCOUNTY OF Jefferson

I, David P. Marcott, having been duly sworn
depose and attest that all of the representations contained in the foregoing
application are true to the best of my knowledge; that I am authorized to
complete and file this application on behalf of the Applicant and this
application has been executed as required by law.

Signed: David P. Marcott

Executive Vice President

Taken, subscribed and sworn to before me the undersigned authority
in my said county, this 13th day of June, 19 77.

Notary Public: Helen L. SwannMy Commission Expires: July 14, 1979

PLEASE NOTE:

Section 40-8-13(2) of the Mined Land Reclamation Act provides as
follows:

"Information relating to the location, size, or nature
of the deposit and marked confidential by the operator,
shall be protected as confidential information by the
Board and the Division and not be a matter of public
record in the absence of a written release from the
operator, or until the mining operation has been
terminated as provided in subsection (2) of section
40-8-21."

Is confidential information contained herein?

YES

(Initial)

NO

(Initial)

Sections desired to be maintained as confidential information -

_____	_____	_____
_____	_____	_____
_____	_____	_____